

**OFFICE OF WASTEWATER  
MANAGEMENT**

## Whole Effluent Toxicity (WET) Program

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### EPA's Whole Effluent Toxicity Program

Whole Effluent Toxicity (WET) is a term used to describe the aggregate toxic effect of an aqueous sample (e.g., whole effluent wastewater discharge or ambient receiving water) as measured according to an organism's response upon exposure to the sample (e.g., lethality, impaired growth or reproduction). WET tests replicate to the greatest extent possible the total effect and actual environmental exposure of aquatic life to effluent toxicants without requiring the identification of specific toxicants. WET testing is a vital component in implementing water quality-based toxic controls that are used for the National Pollutant Discharge Elimination System (NPDES) permitting process.

Examples of the EPA's promulgated WET test methods (40 CFR Part 136) include the freshwater toxicity test which uses the test organism, *Ceriodaphnia dubia* (freshwater flea) and the test organism,

*Pimephales promelas* (fathead minnow). There are two basic types of WET tests: an acute test (96 hours or less, endpoint: mortality), and a chronic test (7 day life-cycle test, endpoints: growth, reproduction, and mortality). EPA has developed WET test protocols using both freshwater and marine/estuarine test species. EPA recommends running tests using an invertebrate, vertebrate and a plant to identify the most sensitive species for developing NPDES WET permit limits.

Organisms used in WET tests are indicators or surrogates for the aquatic community to be protected, and a measure of the real biological impact from exposure to the toxicants. To protect water quality, EPA recommends that WET tests be used together with chemical specific water quality standards. WET tests are designed to predict the impact and toxicity of effluents discharged from point sources into waters of the U.S.

WET limits developed by permitting authorities are included in NPDES permits to ensure that State or Tribal water quality criteria for WET (numeric or narrative) are met. Water quality criteria for WET may be expressed as either a numeric criterion or a narrative criterion (e.g., no toxics in toxic amounts). Alternatively, WET monitoring requirements instead of WET limits are often included in NPDES permits to generate WET data for use in determining when the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the narrative or numeric water quality criteria for WET.

For more information on the NPDES Permit Program see EPA's web site: <http://www.epa.gov/owm/npdes.htm>.

## **Projects**

### **\* *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants \****

This final EPA guidance document provides new updates and additional case study discussions on issues for identifying whole effluent toxicity at municipal wastewater treatment plants. It addresses many issues that stakeholders have raised since the earlier April 1989 edition. This document is intended to provide guidance to permittees, consultants, and permit writers on the general approach and procedures for conducting toxicity reduction evaluations (TREs) at municipal wastewater treatment plants. It is intended to be a guide to the approaches that have been successfully used in municipal TREs. Whether a TRE is voluntary or mandated by a permitting authority, this document may be helpful in preparing and executing a plan to address effluent toxicity. Requests for copies of this document (Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants, EPA/833/B-99-002, August 1999 ) should be directed to Laura Phillips at [phillips.laura@epa.gov](mailto:phillips.laura@epa.gov) or click the followings to read the whole document on line (Adobe Acrobat

PDF files).

### **Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants**

|                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|
| <b><u>Appendix A</u></b> | <b><u>Appendix B</u></b> | <b><u>Appendix C</u></b> | <b><u>Appendix D</u></b> |
| <b><u>Appendix E</u></b> | <b><u>Appendix F</u></b> | <b><u>Appendix G</u></b> | <b><u>Appendix H</u></b> |
| <b><u>Appendix I</u></b> | <b><u>Appendix J</u></b> |                          |                          |

#### ***\*Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System Program\****

This document was developed by an EPA work group to address questions raised by stakeholders on the issue of analytical variability that might be associated with WET testing and how it related to the NPDES permit program. The final document was issued in June 2000 and is available to the public from either the Office of Water's Resource Center at (202)260-1827 or from the National Center for Environmental Publications and Information (NCEPI) at (573)489-8190. This document is also available online in PDF format. If you have additional technical questions on the document, please contact either Debra Denton at (415) 744-1919, E-mail: [denton.debra@epa.gov](mailto:denton.debra@epa.gov) or Laura Phillips (202) 260-9522, E-mail: [phillips.laura@epa.gov](mailto:phillips.laura@epa.gov)

#### ***\* Draft EPA "Clarifications Regarding Toxicity Reduction Evaluations and Toxicity Identification Evaluations in the National Pollutant Discharge Elimination System (NPDES) Regulatory Process"***

This document is being developed by an EPA work group to describe when and under what circumstances toxicity identification and reduction evaluations should be triggered. This draft document will address stakeholder requests for EPA clarification on TIEs/TREs as to "when, why, and how" TIE/TREs should be required and under what conditions a TIE and/or a TRE is appropriate to conduct. For additional information please contact Laura Phillips at [phillips.laura@epa.gov](mailto:phillips.laura@epa.gov)

### **Whole Effluent Toxicity (WET) Training Courses Via SETAC\***

The Society of Environmental Toxicology and Chemistry (SETAC) has developed a two-day Whole Effluent Toxicity (WET) training course which is part of the SETAC Foundation's on going activities under a cooperative agreement with the United States Environmental Protection Agency's (EPA) Office of Wastewater Management (Water Permits Division). SETAC's WET training course schedule is updated periodically and available on SETAC's web site. The WET course will cover water quality topics such as Criteria and Standards, National

Pollutant Discharge Elimination System (NPDES) Permit Program, WET testing and quality assurance/quality control (QA/QC), as they apply to the WET program. If you would like to request a two day training course for your State, Tribe or group or need more information about the course or the schedule, see SETAC's web site at <http://www.setac.org/wetrain.htm>, call (850)469-9777, or contact Greg Schiefer of the SETAC Foundation (850) 469-1500, Fax: (850-469-9778), E-mail: [schiefer@setac.org](mailto:schiefer@setac.org).

### **(SETAC) WET TRAINING COURSES**

### **Other Links**

- \* [WET Methods](#)
- \* [Documents Aquire Database](#)
- \* [Society of Environmental Toxicology and Chemistry \(SETAC\)](#) 
- \* [USEPA Office of Science and Technology](#)
- \* [Aquire Database](#)

**Back To Top**

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<http://www.epa.gov/owm/wettest.htm>